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Socio-spatial inequalities in the cities and their recent evolutions: comparison between Besançon, Mulhouse, and Strasbourg

Inégalités socio-spatiales dans les villes et leurs évolutions récentes : comparaison de Besançon, Mulhouse et Strasbourg

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Résumés

English Français

This paper describes and analyzes socio-spatial inequalities in the cities of Besançon, Mulhouse, and Strasbourg and their evolutions, both from the categorization of spaces and from the urban heritage. The idea is not only to better understand how inequalities develop in cities, but also to measure and track the dynamic of these inequalities between 1990 and 2007, which reveal specific socio-spatial structures and evolutionary factors. Each of the three study areas has its own specific characteristics (from a geohistorical, cultural, socio-economic and political point of view) and its own evolutionary trends (towards varying degrees of socio-spatial mix). More exactly, the mobilization of spaces took place mainly around the historical center especially in Besançon and Strasbourg, but also within the most attractive zones initially favoured by the bourgeoisie. As for the recent general evolutionary trend, it is towards the improvement of the socio-economic conditions of Besançon, to the pauperization of Mulhouse and finally both to the gentrification and the degradation of Strasbourg.

Ce papier propose de décrire et analyser les inégalités socio-spatiales des villes de Besançon, Mulhouse et Strasbourg ainsi que leurs évolutions, tant à partir de la catégorisation des espaces qu'à partir de l'héritage urbain. L'idée est non seulement de mieux comprendre comment les inégalités se construisent dans les villes, mais aussi de mesurer et suivre, entre 1990 et 2007, la dynamique de ces inégalités qui révèle des structures socio-spatiales et des facteurs d'évolution spécifiques. Les trois zones d'étude présentent des particularités (d'un point de vue géohistorique, culturel, socio-économique et politique) et des tendances d'évolution (vers plus ou moins de mixité socio-spatiale) qui leur sont propres. Plus précisément, la mobilisation des espaces s'est effectuée principalement autour du centre historique notamment à Besançon et Strasbourg, ainsi qu'en fonction des zones les plus attractives investies en premier lieu par les classes bourgeoises. La tendance d'évolution globale récente révèle, quant à elle, une amélioration des conditions socio-économiques pour Besançon, une paupérisation pour Mulhouse et enfin aussi bien un embourgeoisement qu'une dégradation pour Strasbourg.

Entrées d'index

Mots-clés : inégalités socio-spatiales, trajectoire, catégorisation, héritage urbain, Besançon Mulhouse, Strasbourg, France
Keywords : socio-spatial inequalities, trajectories, categorization, urban heritage, Besançon, Mulhouse, Strasbourg, France

Texte intégral

Introduction

1 The spatial distribution of urban functions and populations is not random, it can highlight important dynamics of separation. Indeed, urban societies show multiple socio-spatial inequalities which represent social and territorial dysfunctions (Tissot and Poupeau, 2005). Separation of different social groups in one same urban area can be forced or chosen, and can reveal more or less significant tensions between social classes which are opposed in the social hierarchy (Roncayolo, 1952 ; Brun and Chauviré, 1983 ; Pinçon and Pinçon-Charlot, 1989, Chauviré and Chauviré, 1990 ; Brun and Rhein, 1994). These socio-spatial inequalities are shown differences in access to employment, housing quality and territorial integration between the cities.

2 Because of the magnitude of this phenomenon, we seek to better understand how socio-spatial inequalities are constructed and change within the cities, in connection with their own history and particularly with political actions including those with

relevance to housing and urbanism. Indeed, socio-spatial inequalities question our democratic societies that are based primarily on the principle of equality. The latter refers, in its Rawlsian conception[1], to the notion of social and spatial justice. In France where the multicultural model[2] is often rejected in the name of republican equality, one of the solutions proposed and adopted by urban policies is the principle of social mix. However, policies which promote this principle (especially the Town Policy: "*Politique de la Ville*", the Urban Renewal and Solidarity Act: "*Loi Solidarité et Renouvellement Urbain*", the Urban Social Cohesion Contracts: "*Contrats Urbains de Cohesion Sociale*"...) have not successfully reduced divisions, and they have even sometimes accentuated them (Commerçon, 1988 ; Simon, 1995 ; Subra, 2006 ; Bilek et *al.*, 2008 ; Charmes, 2009 ; Giroud, 2015).

3 This paper explores division phenomena through the analysis and comparison of the existing socio-spatial differentiations and transformations within three cities: Besançon, Mulhouse and Strasbourg. In this paper, we highlight their urban structures and their evolutionary factors (from a historical, demographic, socio-economic and political point of view). Therefore the comparison between these three cities is informative, particularly with reference to their regional context, their size and their geographic proximity.

The dynamic of inequalities: analysis of the differentiations and the transformations

Which theoretical context ?

4 In recent centuries, urban spaces have evolved a lot and show sets of differentiated populations, housing and activities (Bourdeau-Lepage and Huriot, 2005 ; Grafmeyer and Authier, 2011). Indeed, socio-spatial differentiations appear to be a constant over time (Smith, 2010) and Rosanvallon (2011) explains that we must, of course, permit them, but they should be relatively limited in order to ensure "living together" and social peace. The principle of social mix being favoured, many researchers have shown that spatial proximity is far from a reliable index of social integration (Chamboredon and Lemaire, 1970 ; Rhein, 2002). In other words, spatial proximity does not necessarily produce social proximity; the boundaries between social classes are difficult to overcome despite their cohabitation. In this sense, Donzelot (2006) explains that the population redistribution policy cannot, by itself, struggle against these logics of separation. Besides, inequalities are dynamic in nature (socially, geographically, economically, demographically, politically...); which is why it is both interesting and original to compare the dynamic of inequalities. Finally, we seek to know how these inequalities evolve over time, while observing if the gap between the most deprived areas and the most privileged areas is reduced or increased.

5 Urban structures can be different from one city to another, and they can have major differences within one single city. Indeed, the city has several facets and represents, according to Berry (1964), "*a system within systems of cities*". These diverse facets generally vary between populations, urban heritage, political actions... Therefore, cities, by their spatial patterns, their history, their economic and institutional organization, can show more or less pronounced socio-spatial inequalities. These different socio-spatial forms, whether they were politically determined or they spontaneously result from diverse dynamics, crystallize

and reflect the logics that the societies and functions contain (Ascher, 2001). Thus, the idea is to focus on urban areas more likely to reveal the strongest inequalities (Tissot and Poupeau, 2005), more or less visible depending on the chosen scale.

Which spaces?

6 This article focuses on the city, but also considers the various possible scales of analysis in order to better meet our objective. The spatial delimitation which corresponds the most to the agglomerated part of a city and has similar morphological cutting rules from one city to another is the French urban unit. It usually features a central town and its suburbs. Therefore, with the urban unit, we can consider urban space firstly as a whole, then we can solely focus on its central town which is composed by several neighborhoods (more exactly, aggregated units for statistical information: "*Îlots Regroupés pour l'Information Statistique*", IRIS[3]).

7 In order to provide examples of both comparable and diverse cities, – while reducing regional context differences –, we selected three urban spaces located in one same geographical area (Northeast of France). These three cities have developed and grown at the same pace as most French cities, where local history has strengthened urban characteristics. Indeed, by taking into account the geo-history of the cities, we can better understand their contemporary functioning, and in particular the phenomena of inequality that may emerge (appendix 1). First, Besançon is distinguished by its outstanding historical environment, especially the Citadel built by Vauban located on a hill in the old town. The use of spaces is focused around the centre of Besançon and relates to the distance to this centre. As for Mulhouse, the city shows two distinct zones (one privileged residential hill in the South of the city, and one working-class industrial flat area in the North) that have been shaped by the influence of its river, its industrial past, its numerous "*cités ouvrières*" (districts of Workers' houses), and its German heritage. Finally, Strasbourg, because of its geographical location (i.e. located near Germany's Rhineland and in the junction of two roads, from Italy to Flanders and from France to Central Europe) quickly became a very active economic centre. It also has a very diverse heritage that we can primarily observe in the city centre. This city centre as well as the districts located in the North have prestigious European activities, and they contrast with the rest of the city (Najib, 2013). Moreover, these three cities were also chosen for their different demographic weight in order to measure and compare the importance of this criterion with regard to the phenomena of socio-spatial inequalities. This allows us to present an in-depth study on medium-sized cities, while most of the known literature focuses rather on very large cities (Tabard, 1993 ; Brun and Rhein, 1994 ; Mansuy and Marpsat, 1994 ; Lajoie, 1998 ; Guilly and Noye, 2004 ; Schwabe, 2007). Indeed, medium-sized cities have been investigated in a limited number of studies on this topic (Commerçon, 1988 ; Rérat, 2012). In this case, we study the two medium-sized urban units of Besançon and Mulhouse, as well as Strasbourg a metropolis with a wider extent. More exactly, today the medium-sized urban units contain more than 170 000 inhabitants, and Strasbourg almost 500 000. In addition, Besançon has a high rate of tertiary jobs, while Mulhouse is more of an industrial city and Strasbourg has European metropolitan functions. These diverse features help us to choose and compare these three socio-spatial organisations and their evolutionary trends.

Which approaches and which data?

8 Studying the dynamic of socio-spatial inequalities leads us to focus on complex relationships between social structure and spatial structure, and how they change over time. In other words, we are interested in relationships that the social groups maintain with their space; this relationship is analyzed not only from the spatial distribution of populations and housing, but also according to the socio-spatial trajectory of Besançon, Mulhouse and Strasbourg and their districts. In a comparative perspective, it then seems relevant on the one hand to describe the residential and separation logics, and on the other to follow evolutionary trends towards increasing pauperization, gentrification or socio-spatial mix. Indeed, there is a strong link between the type of household and the type of housing because in general the privileged classes are keen to distance themselves from deprived areas, and the poorer classes are increasingly relegated to enclaved and marginalised areas (Maurin, 2004 ; Buisson and Mignot, 2005). As for the middle classes, which are characterized by greater diversity, they occupy the rest of the city or coexist with other social categories (Bidou, 1984 ; Oberti and Préteceille, 2004). In this sense, Donzelot (2004) refers to the three-speed city in which there is a gentrification of city centres, a flight of middle classes into a less expensive periphery and a marginalization of poor people in social housing areas. In this article, we also consider whether or not this model applies to these three cities within our study.

9 Here, inequalities are not only observed via the conventional statistical indicators of the French Population Censuses (*Recensements généraux de la population*, RGP), which refer to the characteristics of households and housing, but are also related to the urban heritage of the studied areas. The selected data from 2007 (table 1) allows us to characterize districts by homogeneous groups and thus to identify, firstly, the socio-spatial differentiations within the urban units of study. It is necessary to specify that the choice of these data was constrained by the datasets available at the infra-urban scale (IRIS). These variables, which are essential to the tradition of human ecology, have been selected because they highlight the relationships that individuals maintain with their territory. More exactly, they refer to the life cycle of the inhabitants, as well as to the the residential cycle of urbanization, and allow us to identify specific socio-spatial categories.

Table 1: Themes and description of the selected indicators

Themes	Indicators
Housing	Type of housing and tenure status of the main residences: - The share of single detached houses in all the residences; - The share of flats in all the residences; - The share of owner-occupiers in all the residences; - The share of social rented housing in all the residences; - The share of private rented housing in all the residences; Property build period of the main residences: - The share of the properties built before 1949 in all the residences; - The share of the properties built between 1949 and 1974 in all the residences; - The share of the properties built between 1975 and 1989 in all the residences; - The share of the properties built between 1990 and 2004 in all the residences;
	Socio-occupational categories of the household reference person:

Socio-occupational categories	- The share of artisans, traders, entrepreneurs in all the socio-occupational categories; - The share of executives, professionals in all the socio-occupational categories; - The share of intermediate occupations in all the socio-occupational categories; - The share of employees in all the socio-occupational categories; - The share of workers in all the socio-occupational categories; - The share of retirees in the total population; - The share of others, without activity in the total population;
Demography	Age of people in the total population: - The share of people under 18 in the total population; - The share of people aged 18-24 years in the total population; - The share of people aged 25-39 years in the total population; - The share of people aged 40-54 years in the total population; - The share of people aged 55-64 years in the total population; - The share of people aged 65-79 years in the total population; - The share of people aged 80 years or older in the total population;
Family	Family status: - The share of single people in all families; - The share of couples without children in all families; - The share of lone parent families in all families; - The share of couples with children in all families; - The share of couples with no children under 25 in all families; - The share of couples with 1 child under 25 in all families; - The share of couples with 2 children under 25 in all families; - The share of couples with 3 or more children under 25 in all families.

Source : INSEE

10 Maps depicting the spatial distribution of the various selected criteria demonstrated very common models of spatial organization (center-periphery, radioconcentric, multi-polar models...) (Najib, 2013). Subsequently, we decided to summarise this important set of information by establishing a typology via a Principal Components Analysis (PCA) and a Hierarchical Cluster Analysis (HCA). This typology shows, for the three urban units of this study, that the suburb is more homogeneous than the central town and highlights the correlations between the built structure and the composition of the households (*ibid*.). This led us to focus the continuation of our analyses, that is to say the study of the socio-spatial trajectories, at the level of the central town because it presents a greater heterogeneity between IRIS (in particular in terms of the age of the population, the family situation, and the socio-occupational category of households) and probably the strongest inequalities.

11 This diachronic analysis of trajectories provides, secondly, information on the transformation of urban structures. This is a rather original method of analysis; it is carried out at the scale of the municipality over a recent period of almost twenty years (from 1990 to 2006[4]) covering different stages of urban policy. Until the late 1980s, priority was given to the accomodation problem in French mass housing. From the 1980-1990s, the social question became more prominent with several programs on delinquency, school failure, social cohesion, etc. (such as the Social Development of Districts: "*Développement Social des Quartiers, DSQ*", the Zones of Priority Education: "*Zones d'Éducation Prioritaire, ZEP*", the Sensitive Urban Areas: "*Zones*

Urbaines Sensibles, ZUS"...). Then, policy in the 2000s' marks an advance because it reconsiders urban space as a whole rather than focusing on certain priority zones, and the measures taken are more directive. We can read the impact of the various measures on the urban system because the multi-date exploratory factorial analysis used for this purpose, allows us not only to describe the socio-spatial configuration of the studied cities, but also to follow its evolution over time.

12 Ultimately, this quantitative approach, linked to urban ecology, is not new, except for the multi-date approach which is still quite innovative today. The first known studies on the measurement of socio-spatial inequalities date from the 1950s and were developed in the United States (especially in Chicago). The quantitative analysis of different forms of social division in cities developed in France later, in the 1960-1970s; it was initially the work of researchers from the Paris region (notably the demographer Catherine Taisne-Plantevin and the engineer Michel Barbier) as well as the Dupont Group (a French-speaking association of geographers founded in 1971) and a team of researchers from Strasbourg (including the geographers Michel Pruvot and Henri Reymond) (Rhein, 1994 and 1997). In addition, factorial analyses are generally neglected in favor of strict methods of segregation analysis, such as segregation indices, especially in the United States. These indices have a strong echo in American political action, in particular with the reference to the evaluation of desegregative policies (Rhein, 1994). They are, in fact, very evident in legal debates on residential segregation between the neighborhoods of Blacks and Whites. However, factorial analyses are well known in this field, although the diachronic approach is rarer. Examples of factorial trajectory analysis are given in Shevky and Bell (1955), Abu-Lughod (1969) and Johnston (1973) for Anglo-Saxon stuides, then in Piron et *al*. (2004 and 2006) for French studies. Finally, many works involving these factorial methods within the three studied cities of Besançon, Mulhouse and Strasbourg exist (Weber, 1982 ; Pruvot and Weber-Klein, 1984 ; Gerber, 1999 ; Floch, 2007), but they do not use the same scales of analysis. In certain cases, these studies give us some points of comparison (for example, the pockets of segregation highlighted by Floch (2007)), but very often the scales of analysis diverge and the comparison is not possible.

The geohistorical construction of cities: differentiated logics of urbanization

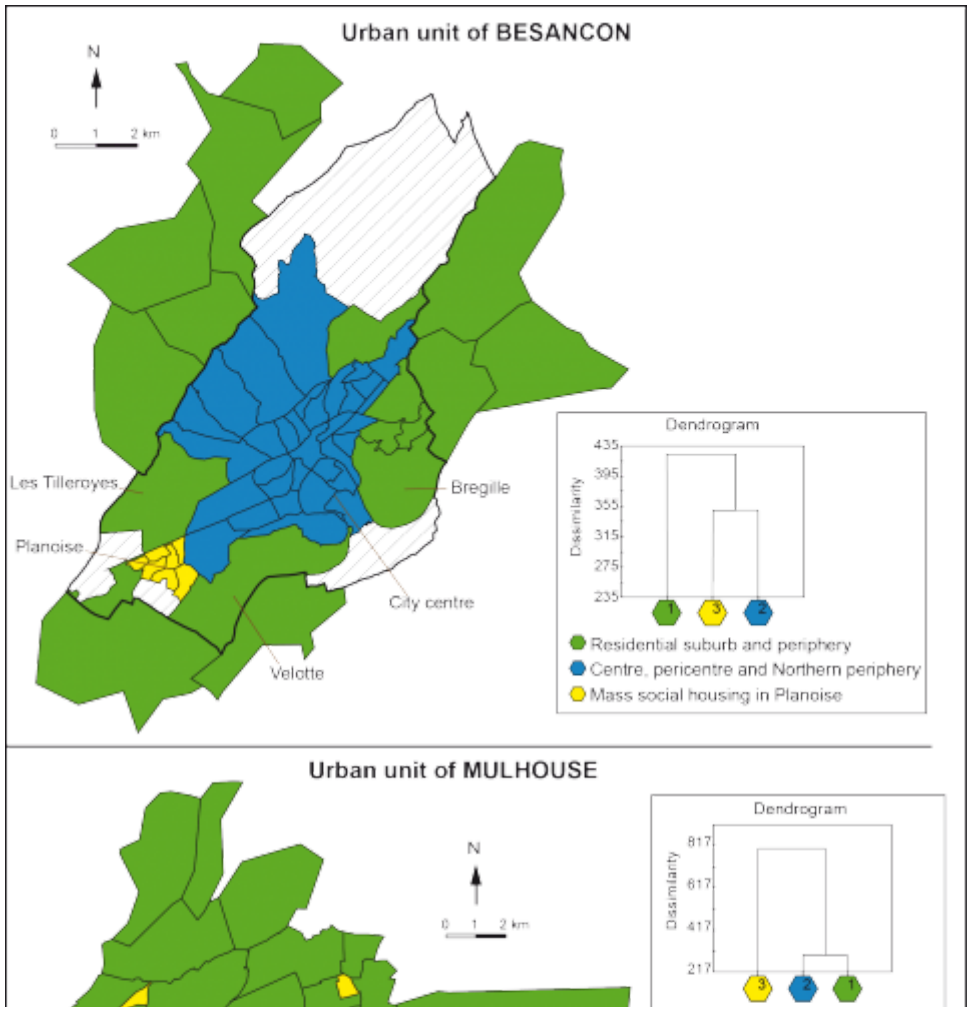
13 Before working on the evolution of socio-spatial inequalities of the studied cities, it is necessary first to bring them to light. This means observing contemporary urban structures, seeing if they bring out specific differentiations, better understanding how they are constructed and finally comparing them.

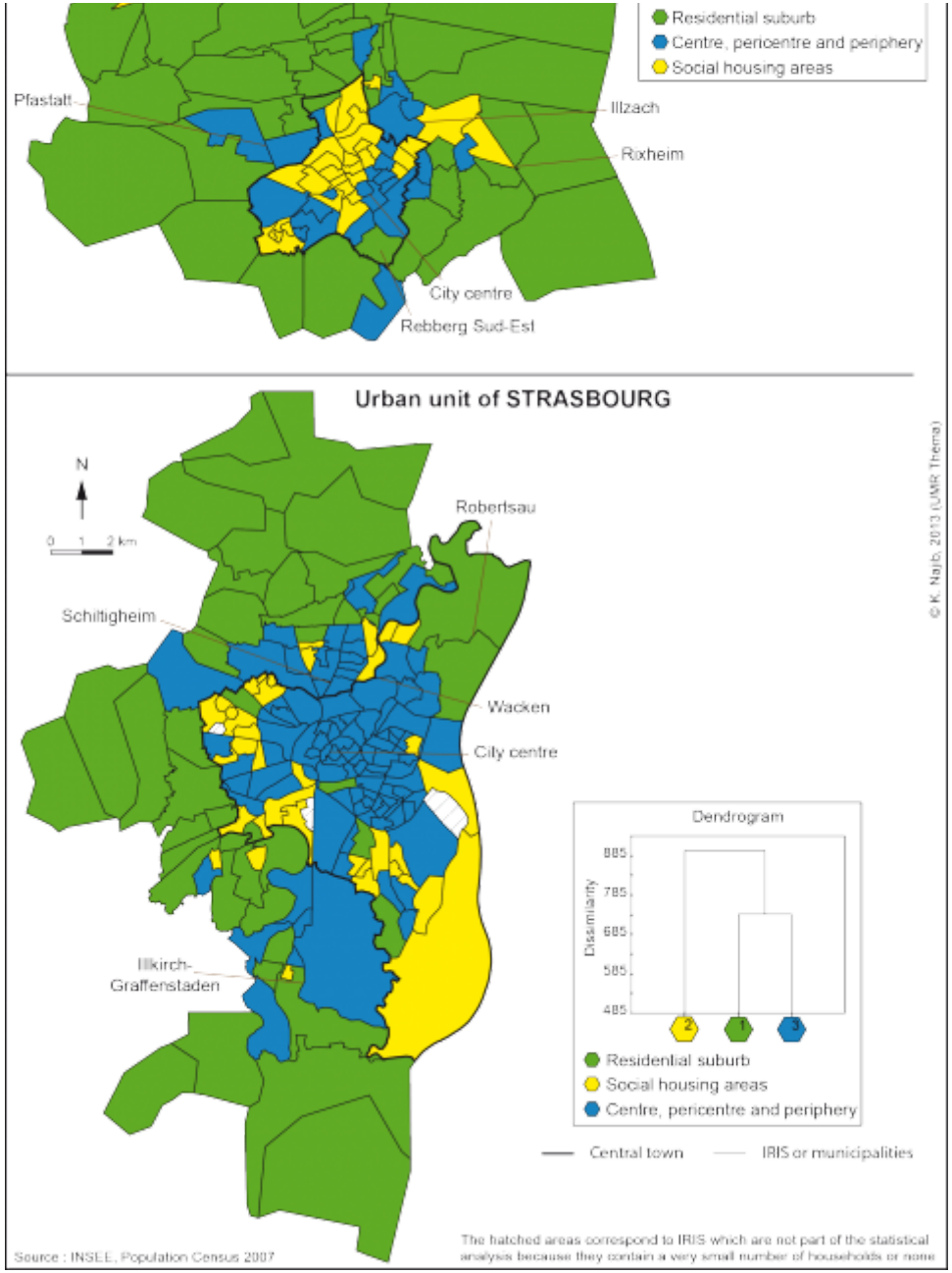
14 It should be noted that a first stage of analysis based on a multi-thematic cartographic work (age, family situation, socio-occupational category, type of housing, build period and tenure status) reveals particular urban differentiations as well as more or less strong correlations between variables. The synthesization of these descriptive data is represented in typological maps – shown in figure 1 – which allow us to visualize the results of the synthesis grouping the studied IRIS according to similarity. The identified typologies are compared with the historical, geographical and urbanistic contexts of the three studied agglomerations in order to better understand their socio-spatial reality, a reality represented in general synthesis schemes (figure 2).

Typology of the studied IRIS districts

15 The typologies below were built from the HCA conducted on the first two factorial axes released by the PCA[5]. The automatic truncation allowed us to identify, for all the study areas, a typology of three very distinct classes. These neighborhood groups are relatively homogeneous (low intra-class inertia) and differ significantly from one another (high inter-class inertia)[6]. Using the typologies, the classes of the three studied areas are seen to divide in the same way. The suburb (in green) contains a high number of municipalities, while the social housing areas (in yellow) are not very numerous and are mainly present in the central town. The predominantly central and pericental districts as well as certain peripheral districts also form a class (in blue). Here, we notice that the historical centre has the same characteristics as its pericentral belt and some peripheral IRIS with regard to the selected variables.

Figure 1 : Typology of the studied IRIS districts in 2007





16 The urban unit of Besançon includes a suburban area mainly made up of detached houses and properties built from 1949 to 1989. Certain types of household are characteristic of these suburban areas, such as owners, retirees, couples with or without child(ren). Although suburbs are generally more homogeneous than the central towns, there is a homogeneous set within

central towns bringing together the historical centre, the pericentre and some of the peripheral districts. In the Besançon example, these are the Northwest peripheral districts. The extension of the city from the historical centre took place in the middle of the 19th century, notably stimulated by the growth of the watchmaking industry. This blue set is characterised by older housing but also housing from the Glorious Thirty Years. It is characterised by the presence of single people amd couples without child(ren), or more exactly, couples without any child under 25 years old at home. Finally, we clearly distinguish the zone of mass housing of Planoise built in the early 1960s according to a Corbusian plan. It is the largest ZUS in Besançon. The other ZUS or social housing districts do not particularly stand out here. In Planoise, the proportion of tenants of Low-rent Housing ("*Habitations à Loyers Modérés, HLM*") is the highest, as are those of workers, lone parent families, young people under the age of 18 and large families.

17 In Mulhouse, the class of social housing areas (in yellow) contrasts with the other two classes, which is shown by its early individualization in the dendrogram and its distance from the blue and green classes. These are mainly within the sensitive areas defined by the Town Policy, with the exception of a few IRIS in the municipalities of Illzach and Dixheim, located in the Eastern suburb. However, the Mulhouse suburb looks like the suburbs of the other study cities, but it is an older and more working-class suburb as a result of the town's important industrial heritage. The yellow class comprises a large proportions of the districts of the central town since Mulhouse, characteristically, contains ZUS in both the city centre-pericentre and in the periphery, unlike Besançon and Strasbourg which do not contain ZUS in their city centre. There are high proportions of couples with child(ren), properties built in the period 1949-1974, workers, young people, HLM tenants and retirees. Furthermore, in this class, single family houses and properties built before 1949 are clearly more numerous than in Besançon and Strasbourg, which can be explained by the non-negligible presence of "*cités ouvrières*" some of which have become, nowadays, ZUS. Indeed, Mulhouse saw in its territory, from the middle of the 19th century, the development of the first "*cités ouvrières*" of France (Jonas, 2003). In the blue class (which includes the historical centre as well as part of the pericentre and the periphery), the majority of properties were also built before 1974. Tenants of the private sector as well as owner-occupiers are very numerous in these areas, as are single people, childless couples, executives-professionals and the intermediate occupations. This disctrict profile is also present in some zones located in the first ring of the city.

18 The last example is the urban unit of Strasbourg which includes a suburban area with fewer single detached houses. Indeed, the proportion of single family houses is lower, with a difference of about 13 and 15 points respectively in the comparison with the urban suburbs of Besançon and Mulhouse. The Strasbourg agglomeration must provide housing for its large population (almost double that of Mulhouse within a very similar area, and triple that of Besançon which extends over an area twice smaller). Therefore, collective housing is dominant. The central and pericentral districts, together with some peripheral districts, also form one single class showing a high proportion of older properties. Indeed, in this class, the proportion of the properties built before 1949 is 37%, against 31% for Mulhouse and 26% for Besançon. Similarly, executives-professionals are the more numerous than elsewhere (with a percentage of 17%, that is almost 6 points difference with the other two studied cities). This is one of the characteristics of large metropolises, beside their European significance. As in Mulhouse but to a lesser degree, these two categories of districts contrast with social housing areas which also predominantly correspond to sensitive areas, except for some IRIS located in the central town and the suburb. However, these latter IRIS seem to have the same precarious characteristics generally identified in ZUS.

19 In sum, we notice that the urban and sociodemographic characteristics of suburbs differ from those of central towns, except for some privileged peripheral districts of Besançon such as Velotte, Bregille, Les Tilleroyes, etc. It is the same in Mulhouse and Strasbourg with regard to, respectively, the districts of Southeast Rebberg and Robertsau. This resemblance is partially a result

of historical urban morphology: these areas' built environment is essentially composed of detached houses from the 18th and 19th centuries. Moreover, we notice that there are some suburban municipalities which have the same characteristics as the blue and yellow classes. We distinguish in particular the municipalities of Illzach and Pfastatt in the Mulhouse suburban area and the municipalities of Schiltigheim and Illkirch-Graffenstaden in Strasbourg. These are part of the continuity of urban planning and the dynamism of their own central town. Since the middle of the 20th century, these areas had certain urban functions (such as a university campus or a commercial area...) which play an important role in the extension of Mulhouse and Strasbourg as well as in their own development.

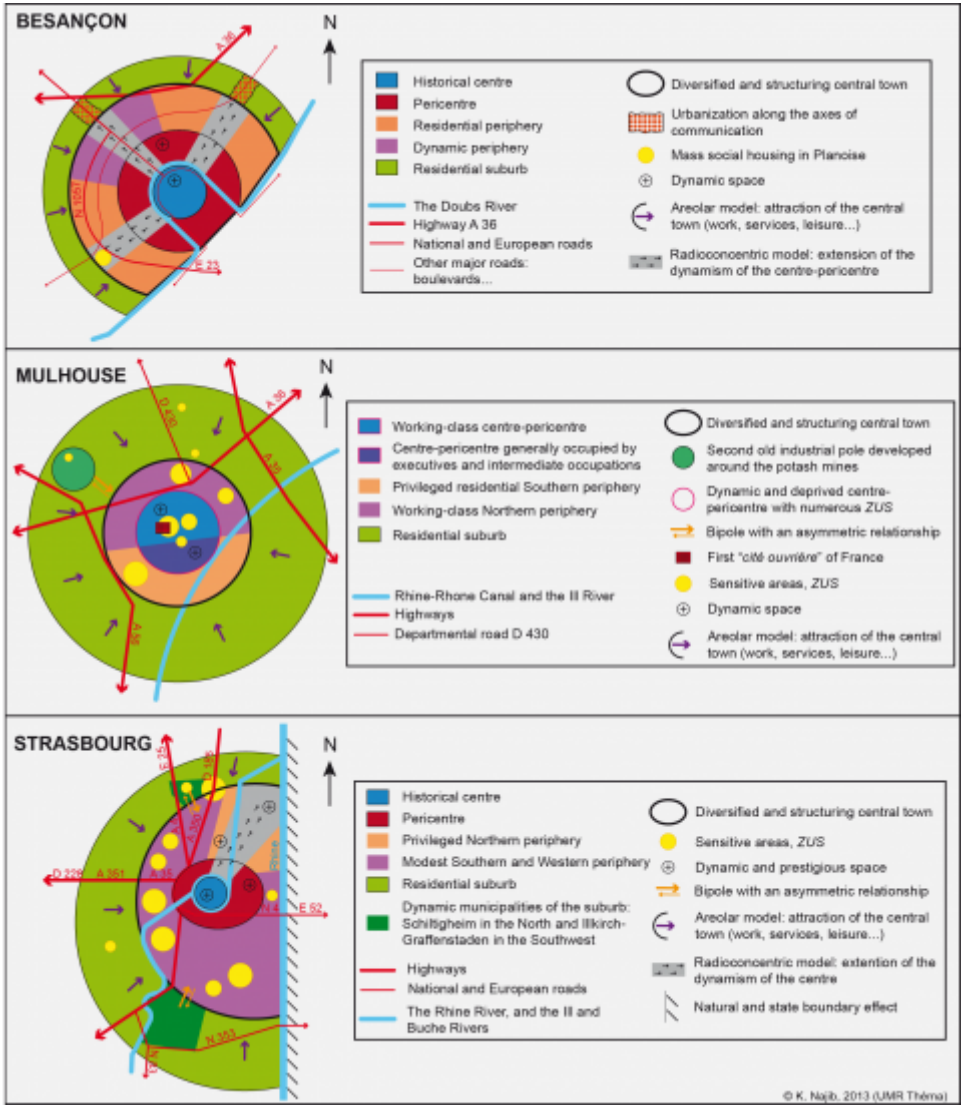
20 Socio-spatial inequalities are undoubtedly more visible and stronger in central towns. This great diversity is mainly evidenced by the presence of different urban morphologies and by the coexistence of socio-occupational categories which are contrasted in the social hierarchy, ranging from the most privileged to the most precarious. These various morphologies and categories can, in certain cases, gather together or appear more scattered and isolated in the city.

Towards the synthesis of an observed and analyzed reality

21 The obtained results help us to better understand the socio-spatial structures of Besançon, Mulhouse and Strasbourg. It is possible to represent these elements composing the real space in synthesis schemes (Brunet, 1980 ; Reymond et *al.*, 1998). These allow us to go further in the synthesis by showing the general functioning of the studied areas as well as the power relationships resulting from the land use, relationships revealing strong divisions between spaces.

22 The schemes presented in figure 2 do not seek to compete with the well known reference models, but rather to describe a more or less consistent composition of related places, that is to say to represent the territory in terms of form, configuration, dynamism, diversity... The choice of the elements in the legend drew on the analysis of various studies in history, sociology and urban geography (Chevalier and Scherrer, 1957 ; Folhen, 1982 ; Cuillier, 1994 ; Jonas, 1994 and 2003 ; Pinol, 1996 ; Borraz, 1998 ; Fabriès-Verfaillie and Stragiotti, 2000 ; Gaschy, 2011) as well as the analysis of statistic data from the population censuses from 1990 to 2007. On the one hand, historical, sociological and geographical researches allow us to understand how the phases of industrialization defined space and caused the construction of a particular housing stock, how the built environment and road network reflects the history of the city and the urban morphology, and finally how urban functions lead to particular residential logics of urbanization. On the other hand, the cartographic work stemming from the INSEE variables (table 1) at different dates, prior to the typology, allowed us to describe in detail the socio-spatial differentiations and to characterize the dynamism of spaces.

Figure 2 : Schemes of the socio-spatial organisation of the studied urban units



23 The socio-spatial organisations of the three urban units of study show both similarities and differences. First of all, as in most European cities, Besançon, Mulhouse and Strasbourg are all built from a centre around which have developed peripheral belts, then a suburban areas. The latter are strongly attracted to the central town for its various urban functions. Thus, the main model of urban structure is the centre-periphery model, although in addition there are some radial axes which restructure the space and some economically precarious focal points.

24 As far as differences are concerned, we find certain properties which lead each of the cities to differentiate themselves from the two others. Concerning Besançon, we can see that it contrasts with Mulhouse and Strasbourg by its restricted suburb (a periurban type residential suburb) and by its purely radioconcentric urban model (Hoyt, 1939). Indeed, the main axes of

communication strongly structure the city of Besançon and its suburbs mainly developed along these axes, which is less the case for the suburbs of Mulhouse and Strasbourg. Moreover, Besançon has no North/South (or East/West) asymmetry unlike the studied Alsatian cities. The North of Mulhouse is essentially occupied by workers and other economically inactive persons, while the South (specifically the districts of Dornach and Rebberg) shows a high proportion of executives-professionals and intermediate occupations. Conversely, in Strasbourg, the executives-professionals are located in the districts making up the historical centre and Robertsau in the North including the Wacken site, an international business district. These districts form a privileged set which contrasts with the rest of the city.

25 As for the urban unit of Mulhouse, it differs from Besançon and Strasbourg by its "centre-pericentre" set. The historical centre of Mulhouse tends to aggregate with its pericentre and undoubtedly plays a less structuring role than the city centres of Besançon and Strasbourg. It seems that young adults (students and economically active young people) have intensely structured the cities of Besançon and Strasbourg, especially their historical centres (Najib, 2013), which is less the case in Mulhouse. The latter is distinguished above all by its more working-class socio-economic configuration. The proportion of executives-professionals is considerably lower than in Besançon and Strasbourg (nearly 5 points less) while that of the workers is very much higher (almost 9 points more). Therefore, Mulhouse looks like an industrial city, while Besançon and Strasbourg are more reliant on the tertiary sector. Its military and industrial past, particularly the presence of former large "*cités ouvrières*" built according a checkerboard pattern, gives Mulhouse a specific socio-spatial structure with a less star-shaped settlement pattern than Besançon and Strasbourg. These "*cités ouvrières*" of Mulhouse amount to homogeneous poles which differ from the rest of the city. There is also a second industrial pole, which developed after the opening of potash mines in 1904, located in the Northwest suburban municipalities. Subsequently, as a result of the decline in mining activity, this part of the suburb has developed commercial areas offering many low-income jobs (Dassonville et *al.*, 2011).

26 Finally, the urban unit of Strasbourg is distinguished from the two other studied agglomerations, above all by its highly concentric urban model. The central core is dominant (high concentration of population, economic activities, power...) and we can observe its influence up to the periphery. The significant demographic dynamism of Strasbourg can lead to disadvantages and advantages at the same time. Indeed, in large cities, there are usually more negative externalities (Berroir, 1996 ; Thisse and Van Ypersele, 1999). Thus, we could say that Besançon and Mulhouse enjoy similar characteristics corresponding to what is known as "quality of life in medium-sized cities" (Commerçon, 1988 ; TNS-Sofres, 2007). Having said that, Strasbourg – a metropolis whose European vocation is no longer in doubt –also has numerous metropolitan functions which allow a large and diverse supply of employment and education, public services, equipments, etc., which can be very attractive for various populations (students, active young people, exectuives-professionals...). Consequently, the city of Strasbourg is characterized by a greater need for housing. It differs from Besançon and Mulhouse by its higher rate of collective housing, especially within its suburbs. In addition, there are a lower proportion of owner-occupiers, certainly because of a tighter[7] housing market which can contribute to greater tensions, making the trajectories of the poorest households and the middle classes more delicate. This is why a complementary analysis of socio-spatial transformations has been carried out, always taking care to identify the specific evolutionary factors which are generally historico-political factors.

The socio-spatial transformations and their evolutionary factors

27 After highlighting the socio-spatial differentiations of the three studied cities, it is interesting to observe their recent evolutions. Previously, we have shown that the suburb constitutes a more homogeneous set compared to its own central town. However, the latter shows stronger internal dynamism and heterogeneity, which leads us to measure only the socio-spatial transformations of central towns. Moreover, we have reduced the total number of indicators[8] in order to avoid redundancies and to have more robust analyses. Thus, with this reduction of both the perimeter of study and the number of indicators, it is possible to enrich the approach by maintaining the temporal dimension through diachronic analysis. *In fine*, we will be able to verify whether important constants emerge within the studied cities or if, conversely, the structures of differentiation change significantly.

An original comparative method : multi-thematic, multi-date, multi-scale and multi-city

28 Here, the objective is to observe and analyze the evolution of different territorial organizations of the three study cities. To do this, we adopt a comparative method based on two scales of analysis (both the city and its IRIS), which provide a simplified view of the urban structure and a readable representation of transformations according to a certain number of indicators. This approach is based on the three population censuses of 1990, 1999 and 2006, which ensures that we have both relatively homogeneous databases and a large enough evolution period (17 years) for us to appreciate the evolution of the socio-spatial transformations of Besançon, Mulhouse and Strasbourg.

29 The study of trajectories, often used to make comparisons of interurban evolution (Sanders, 1992 ; Pumain and Saint-Julien, 2001) has not been much implemented at the infra-urban scale. It assumes a new PCA carried out on the three studied cities. It should be noted that this approach only makes sense if the collected data make use of a common measure (Préteceille et *al.*, 2005), which is the case here (the percentage). In detail, the analysis is conducted on the basis of one single PCA (normalized centered reduced) carried out, for each city, on the most recent IRIS data, that is, from 2006. In these PCA without rotation, the IRIS data from previous years (i.e. 1990 and 1999) are added as additional statistical individuals. The latter, unlike active individuals (from 2006), do not intervene in the determination of the factorial axes, but are projected on the factorial plan. Thus, the scale of the factors, defined on the basis of the 2006 data, is strictly identical for the other two dates of analysis. Indeed, one single PCA has been carried out for each of the studied cities; the idea is to first determine the most recent socio-spatial structure, and then draw the trajectory of the IRIS districts from the data projections of 1990 and 1999.

30 The analysis of the positioning of the IRIS is conducted on the first two factors (F1 and F2) because the break between F2 and F3 (Najib and Griffond-Boitier, 2011) is relatively important for all the studied cities (figure 3). Moreover, for the Mulhouse example, F1 is clearly dominant and well characterized, it is also reversed compared to those of Besançon and Strasbourg. The meaning of these two axes F1 and F2 can be read from the contribution of the variables to the factors in the table 2. We observe that it is relatively similar between the three cities. Therefore, the first axis describes the socio-economic situation ranging from the most precarious to the most comfortable situation. The second axis concerns characteristics related to the size of housing and/or socio-occupational categories. Thus, we can see if a district becomes gentrified or deprived from a socio-economic perspective.

Figure 3 : Column chart of eigenvalues in 2006

Table 2 : Coordinates of variables on the first two factors in 2006

	Besançon		Mulhouse		Strasbourg	
	F1	F2	F1	F2	F1	F2
1) Ageing index	0,626	0,062	-0,817	0,039	0,640	0,028
2) Share of foreigners	-0,785	-0,482	0,861	-0,235	-0,629	-0,390
3) Share of households without car	-0,866	0,246	0,740	0,432	-0,739	0,523
4) Share of households with one car	0,581	0,175	-0,078	0,205	0,284	-0,221
5) Share of households with 2 cars and more	0,733	-0,451	-0,759	-0,581	0,631	-0,432
6) Share of collective housing	-0,551	0,529	0,530	0,589	-0,558	0,479
7) Share of small housing	-0,470	0,804	0,176	0,802	-0,251	0,849
8) Share of big housing	0,575	-0,620	-0,577	-0,527	0,593	-0,366
9) Share of unoccupied housing	-0,062	0,397	0,251	0,224	-0,037	0,188
10) Share of owners	0,945	-0,109	-0,783	-0,329	0,793	-0,120
11) Share of workers	-0,601	-0,711	0,873	-0,359	-0,540	-0,755
12) Share of executives-professionals	0,473	0,618	-0,774	0,246	0,408	0,736
13) Share of intermediate occupations	0,592	0,685	-0,844	0,390	0,622	0,420
14) Share of retirees	0,646	-0,132	-0,762	-0,086	0,446	-0,110
15) Share of others, without activity	-0,700	0,209	0,805	-0,420	-0,539	0,059
16) Unemployment rate	-0,751	-0,428	0,933	-0,119	-0,743	-0,487

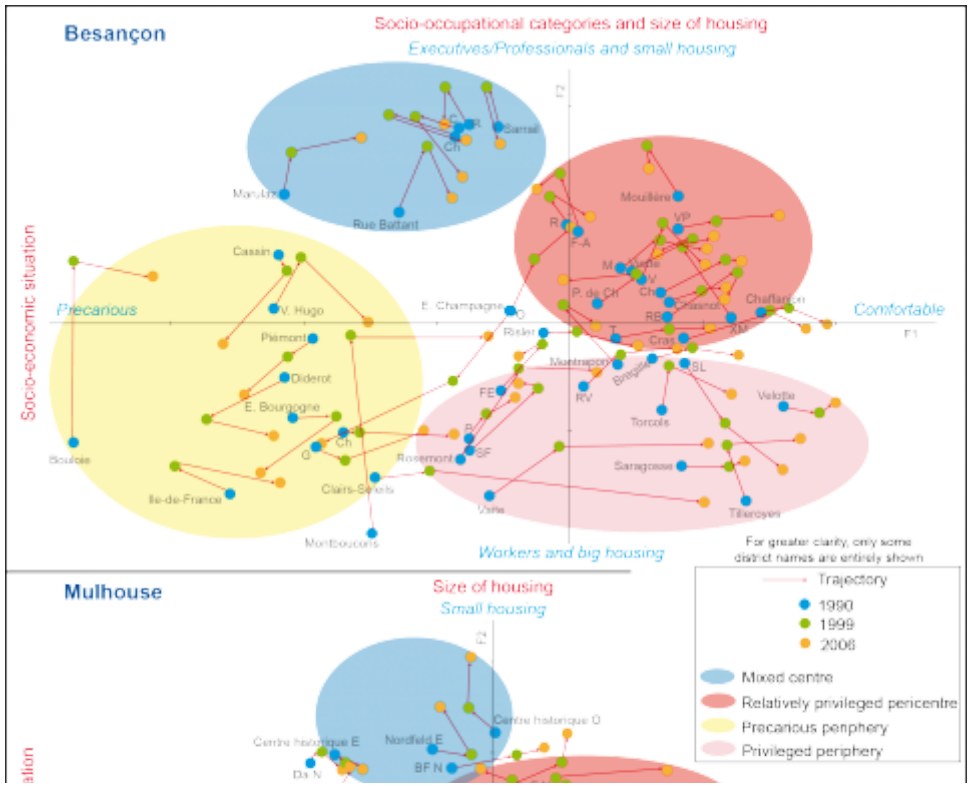
17) Share of professionally active women	0,660	-0,055	-0,707	0,515	0,670	0,011

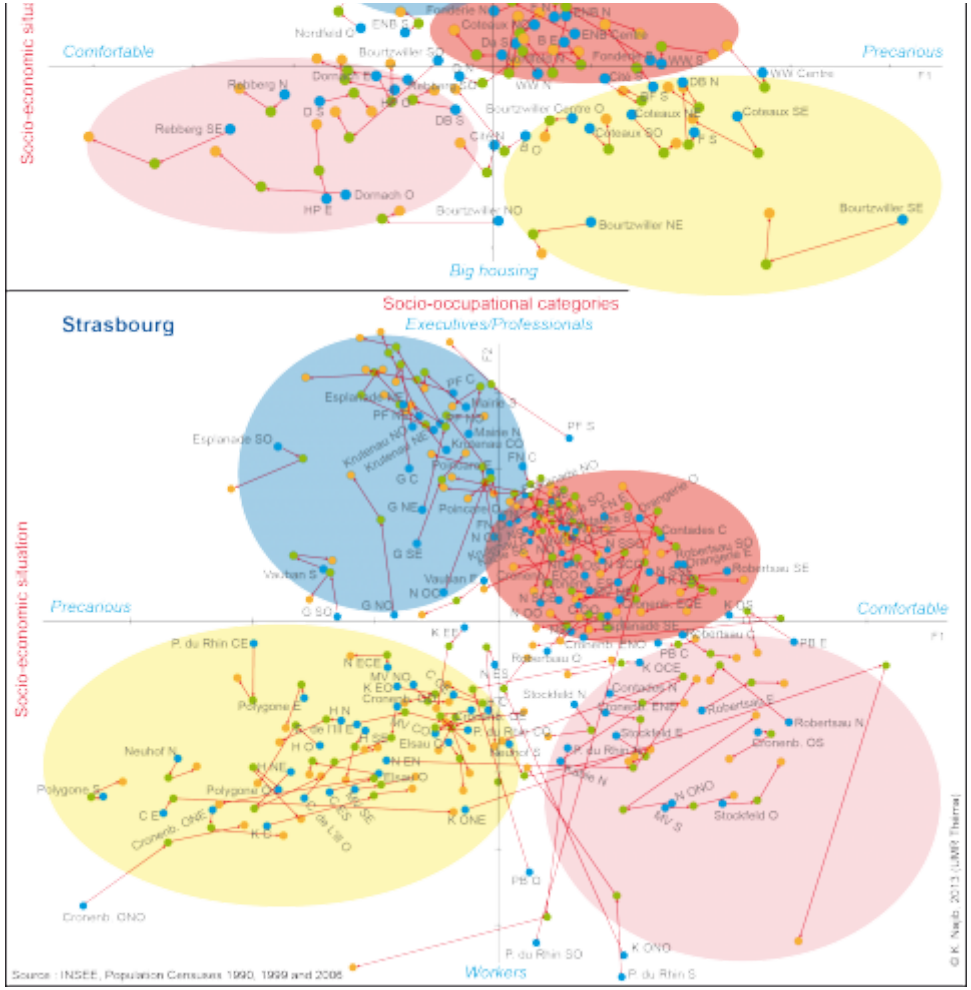
Reading: The most extreme coordinates are highlighted in red

Analysis of the trajectories of the districts of Besançon, Mulhouse and Strasbourg

31 The multi-date exploratory factorial analysis allows to appreciate the trajectory not only of the studied cities but also of their IRIS. Indeed, the mean values of the observed translations by all the Besançon, Mulhouse and Strasbourg IRIS (i.e. at the municipality scale) show that the studied cities have not undergone major transformations (Najib and Griffond-Boitier, 2011), which can be partially explained by the fact that we used a (centered reduced) normalized PCA. Thus, the three urban systems considered obey a certain spatial inertia experienced by the majority of cities (Tellier and Vertefeuille, 1995; Dodgshon, 1998; Boulanger and Trochet, 2005; Harari, 2005). At the IRIS scale, trajectories are more significant. From the factorial graphs (figure 4), we can observe how an IRIS evolves: the nature of the evolution being represented by the direction of the arrow, and the intensity by its length between two dates of study.

Figure 4: Factorial plans (1-2) of the trajectories of the studied IRIS between 1990, 1999 and 2006





32 To facilitate the reading of this somewhat complicated figure, we distinguish the four geographical zones that emerge from the three graphs, and then analyse them. Depending on the positioning of the IRIS on the factorial plans, we generally realise that the major organizational principles of the Besançon, Mulhouse and Strasbourg urban systems are relatively similar. In all cases, there is a mixed historical centre[9], a rather privileged pericentre (although the Mulhouse pericentre is much more precarious due to the presence of ZUS) and a periphery that is both precarious and privileged.

33 The relevance of this figure is that it depicts, from a general point of view, the intensity and the trend of socio-spatial evolutions, which are read according to certain criteria. The proportions of executives-professionals, workers, other economically inactive persons, small housing, owners and retirees are shown to play an important role on the analyzed trajectories because their evolution is stronger between 1990 and 2006 than that of the other selected variables. By observing the impact of all the variables on evolutions, we notice that primarily social variables are highly significant. The analysis of the IRIS trajectories shows that central and pericentral districts mostly evolve very little (small arrows). We can therefore conclude that centres and pericentres are more stable over time. Conversely, peripheral districts undergo major transformations (large

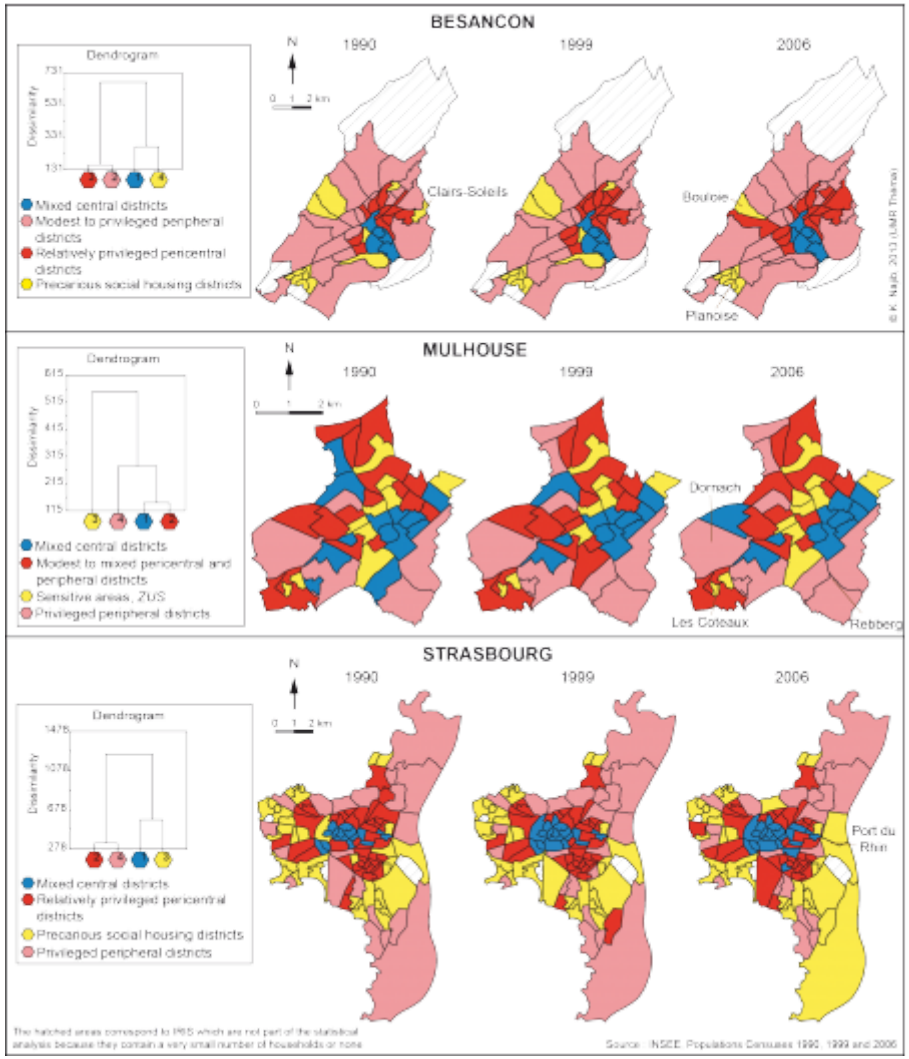
arrows). This is particularly the case for deprived areas (mostly ZUS) which undergo urban renewal operations, sometimes at a very large magnitude. Indeed, politically driven of interventions mainly concern sensitive areas and improve, in some cases, their socio-economic conditions, although the gap with the wealthiest districts is still significant. Concerning these privileged districts, most of them evolve intensely, but few towards a greater mix. Some of them still improve their socio-economic conditions, which goes against the mix objective of urban policies. Thus, we observe that the dynamic of inequalities is more important in the periphery. Besides, we observe that most of the IRIS have strictly reversed trajectories between the two studied periods 1990-1999 and 1999-2006. We may read in this the impact of the strengthening of the Town Policy or the renewal operations of centres and pericentres... because, since the 2000s, political measures are more directive and above all focused on urban space as a whole.

34 Finally, these analyses allow us to observe the evolution of the studied urban structures. In addition to confirming centre-peryphery type structures, they serve to better explain the level of socio-economic precariousness or comfort of the districts as well as their evolutionary intensities and trends. However, these findings resulting from a statistical reading remain difficult to read geographically, which is why a representation in typological maps is suggested below.

Typological evolution of the three studied cities: towards more or less socio-spatial mix

35 This exercise seeks to represent the evolution of socio-spatial inequalities more exactly via maps. To do this, we performed a HCA on all the data, that is to say as well the active individuals (from 2006) as the additional individuals (from 1990 and 1999). These clusters, based on the findings resulting from the multi-date factorial analyses, distinguished four types of districts that we have predefined and approximately represented in the factorial graphs of figure 4. This number of four classes was chosen in order to characterize the urban spaces of Besançon, Mulhouse and Strasbourg, while referring to the four quadrants of factorial graphs, although the automatic truncation distinguishes only three. By taking the next node into account in the dendrograms, the socio-spatial disparities are therefore better detailed and visible.

Figure 5: Between pauperization and gentrification of the studied cities from 1990 to 2006



36 Before analysing the evolution of the inequalities between IRIS (in terms of increase, stagnation or decrease), we can better observe the characteristics of the socio-spatial structure for each of the sudied cities. The spatial reading facilitated by the above mapboard depicts the same types of districts observed via the factorial graphs. The maps also better show the similarity between the concentric urban structures of Besançon and Strasbourg (although the Besançon case shows in 2006 two radial axes reflecting the influence of the main axes of communication, one going from the centre to the Northeast of the city, and the other from the centre to the Northwest). The dendrograms indicate that in Besançon and Strasbourg the historical centre and the social housing areas are more distinct in urban systems. The privileged peripheral districts (or modest to privileged) and the relatively privileged pericentral districts get closer and can form one single class. The distinction of Mulhouse, for its part, is explained by a more polynuclear structure and by a different sequence of partitions in nested classes. Its urban system is largely

defined by its sensitive areas and to a lesser degree by its privileged peripheral districts. The rest of the districts can constitute, according to a certain number of criteria of resemblance, a modest to mixed set.

37 Concerning the evolution of urban structures, we notice first of all that Besançon evolves relatively little between 1990 and 2006, with the exception of the precarious social housing areas (in yellow) which are gradually less distinct. The evolutionary trend of the IRIS is more evident in this respect. We can observe that generally the city shows a clear trend to the improvement of its socio-economic conditions. The trend is therefore rather positive in Besançon. A first study carried out solely on the city of Besançon between 1990 and 1999 had highlighted a significant degradation of some districts known as ZUS (Najib and Griffond-Boitier, 2010), and the question arose as to whether this situation would continue in the future. In 2006, we notice that the ZUS of Planoise still appears in yellow, as does the district of Bouloie which contains the university campus. All things considered, from one date to another and especially during the second period of analysis, the number of social housing areas decreases significantly. The ZUS of Clairs-Soleils, for instance, changes from a deprived district in 1990 to a privileged residential district in 2006. It improves its socio-economic situation after 1999 due to a major urban renewal operation, unlike the other ZUS which experience improvements later on.

38 In Mulhouse, the urban structure in mosaic is very clear and changes little over the studied period. However, there is a general increase of pauperization. Unlike in Besançon, the number of the yellow IRIS (corresponding, here, to ZUS for all of them) increases. Evolutionary changes are in this case more negative. The IRIS are more dispersed in the city despite a significant concentration in the pericentre. Spatial divisions can also be read via the location of privileged districts, which are mainly in the South of the city. We can observe the severance function of the Rhine-Rhone canal (clearer in figure 2 and in appendix 1) completed in 1812, which crosses the Southeast of the city. It divides an industrial and working-class flat area in the North, from a more residential area in the South where wealthy families from the industrial bourgeoisie settled. Indeed, they particularly colonised the slopes of the attractive wooded hill of Rebberg. In addition, in the Western extension, there is another privileged district, the former '*cité ouvrière*' of Dornach, which also separates the heart of the city from the ZUS of Coteaux (created in the 1960s) located in the extreme Southwest of the city.

39 Finally, in Strasbourg, we notice that the central districts developed beyond the historical centre since 1999, demonstrating a form of central diffusion. As for the relatively privileged pericentral districts, they seem more dispersed in the city. The precarious districts are a little more numerous while the privileged Northern part of Strasbourg is better defined. These changes remain relatively small, but they are nevertheless more remarkable than in Besançon and Mulhouse. In sum, the trajectories of all the Strasbourg districts lead to both gentrification and pauperization. Therefore, the evolution appears to be more mitigated in Strasbourg.

40 This mapboard exposes interesting findings, but which remain above all general. Indeed, it allows us to offer a general and readable view of the socio-spatial structures and transformations of the districts composing the cities of Besançon, Mulhouse and Strasbourg. We can also better appreciate the evolutionary trends towards varying degrees of socio-spatial mix. However, these maps show an important limitation related to the magnitude of the change. Transformations can be appreciated only when an IRIS moves from one class to another, unlike in figure 4 which shows the real intensity of the trajectories.

Conclusion

41 This contribution offers a general analysis of the inter-related dynamics of inequalities of three urban spaces located in the Northeast of France. Firstly, the socio-spatial differentiations of the three considered areas show relatively similar urban structures. They all describe a centre-periphery type model (although in detail Besançon rather describes a radioconcentric model and Mulhouse a polynuclear model) as well as a high heterogeneity within the central towns compared to their suburbs. The various geographical areas include a mixed historical centre, a more or less privileged pericentre developed in the end of the 18th century, a periphery essentially built after the Second World War which is both precarious (mainly ZUS) and privileged, as well as residential suburbs that have emerged more recently. The examples of Besançon, Mulhouse and Strasbourg differ somewhat from the three-speed city of Donzelot (2004) because the centres do not necessarily gentrify, and the periphery is also occupied by privileged classes. Having said that, the marginalization of poor people in social housing areas is clearly described in this article. Thus, socio-spatial inequalities are obvious in these urban spaces and they result from the coexistence of the most contrasted categories, especially from a socio-economic perspective. Furthermore, the three urban structures have developed at the same pace as most European cities. They are based upon their medieval city centres, then undergo a less consistent urbanization related to different phases of rural exodus, industralization, hygienic and sanitary revitatlization, and contemporary priority planning. A finer analysis shows that the urban configurations of Besançon and Strasbourg are a little opposed to that of Mulhouse which describes a less concentric model. The historical centres of Besançon and Strasbourg enjoy, to differing degrees, a remarkable architectural heritage, significant tourist attractions, important higher education and research institutions, a large student population, and very specific urban functions related to their status as regional capital.

42 As for the socio-spatial transformations secondly assessed at the central town scale over the period 1990-1999-2006, they are generally quite unimportant. Indeed, urban structures remain relatively similar from one analysis date to another. But in detail, we notice that the peripheral districts show the biggest transformations which reflect different evolutionary trends. On the one hand, we can observe that the precarious districts undergo major changes due to urban renewal operations, and on the other hand the privileged districts do not necessarily become more mixed despite the objectives of certain political measures; they sometimes gentrify even more. Therefore, the inequalities are still present and their dynamic strengthens the socio-economic fractures. The general evolutionary trend of Besançon reveals an improvement of its socio-economic conditions, while Mulhouse rather shows a degradation. As for Strasbourg, it becomes as much gentrified as pauperized. Thus, these trajectories describe positive or negative internal changes that usually result from residential behaviours of the privileged classes as well as urban policies, in particular housing, planning and territorial development policies. These three cities have demonstrated a desire for urban development, notably through the renewal of sensitive areas, or the valorisation of historical centres or socio-economic revitalisation, particularly through the development of commercial areas, tramways, etc.

43 Finally, the relationship between the studies of socio-spatial differentiations and their recent evolutions has revealed that the explanatory factors are of various natures. In order to better understand how inequalities have been constructed in cities, it was essential to seek historical, geographical and socio-economic information. However, the factors determining the recent evolution of these inequalities are more a matter of urban policies. For instance, we note that the industrial history of Mulhouse has considerably structured the city, highlighting strong socio-spatial inequalities, inequalities that we can still observe nowadays, in particular with regard to the bourgeois district of Rebberg which is still separated from the rest of the city. These strong inequalities, which are above all caused by the wealthiest people, have therefore persisted, and political action has taken root in this specific context. The latter has had a real impact especially for the former "*cités ouvrières*" which have benefited from a symbolic recovery in the urban landscape. Whether they have become ZUS or privileged districts, the desire to take into account and preserve industrial heritage has always been present.

44 Ultimately, the various findings resulting from the comparison between two medium-sized cities and one large city, two Alsatian cities and one Franche-Comté city, two regional capitals and one secondary city are highly interesting, although they describe above all a general view of the dynamic of socio-spatial inequalities. In this sense, despite the many limitations of this method of analysis in terms of the relevance of the choices of indicators, the readability of the factorial plans as well as the synthesis and interpretation of the factorial results, the consideration of the specific evolutionary trends (i.e. geographical, historical, cultural, socio-economic and political factors) has helped us to better understand the direct consequences of material and immaterial heritage on the current socio-spatial morphology of the studied territories.

Bibliographie

Abu-Lughod J., 1969, "Testing the Theory of Social Area Analysis: The Ecology of Cairo, Egypt", *American Sociological Review*, Vol.34, No.2, 198-212.
DOI : 10.2307/2092177

Ascher F., 2001, *Les nouveaux principes de l'urbanisme. La fin des villes n'est pas à l'ordre du jour*, La Tour d'Aigues, L'Aube.

Berroir S., 1996, "L'espace des densités dans la ville : théories et modélisations", *L'Espace géographique*, Vol.25, No.4, 353-368.

Berry B., 1964, "Cities as Systems within Systems of Cities", *Papers and Proceedings of the regional Science Association*, No.13, 147-163.

Bidou C., 1984, *Les aventuriers du quotidien : Essai sur les nouvelles classes moyennes*, Paris, PUF, 200 p.

Bilek A., Costes N., Monmousseau F., 2008, "La loi SRU incite-t-elle les maires à construire du logement sociale? Les enseignements d'une analyse principal-agent", *Économie publique/Public Economics*, No.20, 207-237.

Borraz O., 1998, *Gouverner une ville : Besançon, 1959-1989*, Presses Universitaires de Rennes, 227 p.

Boulanger Ph., Trochet J.-R., 2005, *Où en est la géographie historique ? Entre économie et culture*, L'Harmattan.

Bourdeau-Lepage L., Huriot J.-M., 2005, "The metropolis in retrospect. From the trading metropolis to the global Metropolis", *Recherches économiques de Louvain*, Vol.71, No.3, 257-284.
DOI : 10.3917/rel.713.0257

Brun J., Chauviré Y., 1983, "La ségrégation sociale. Questions de terminologie et de méthode", *Espace, populations, sociétés*, No.1, 75-85.
DOI : 10.3406/espos.1983.906

Brun J., Rhein C., 1994, *La ségrégation dans la ville. Concepts et mesures*, Paris, L'Harmattan.

Brunet R., 1980, "La composition des modèles dans l'analyse spatiale", *L'Espace géographique*, Vol.9, No.4, 253-265.

Buisson M-A., Mignot D., 2005, *Concentration économique et ségrégation spatiale*, Bruxelles, De Boeck, 368 p.
DOI : 10.3917/dbu.buiss.2005.01

Chamboredon J-P., Lemaire M., 1970, "Proximité spatiale et distance sociale. Les grands ensembles et leur peuplement", *Revue française de sociologie*, Vol.11, No.1, 3-33.
DOI : 10.2307/3320131

Charmes É., 2009, "Pour une approche critique de la mixité sociale. Redistribuer les populations ou les ressources ?", *La Vie des idées* : http://www.laviedesidees.fr/Pour-une-approche-critique-de-la.html, 13 p.

Chauviré C., Chauviré Y., 1990, "Des frontières invisibles dans la ville ?", *Strates*, No.5, 17-29.

Chevalier M., Scherer J-J., 1957, "Documents sur le développement urbain de Besançon, entre 1840 et 1940", *Annales littéraires de l'université de Besançon*, Paris, 35 p.

Commerçon N., 1988, *La dynamique du changement en ville moyenne : Chalon, Mâcon, Bourg*, Presse Universitaires de Lyon.

Cuillier F., 1994, *Strasbourg, chronique d'urbanisme*, L'Aube, 261 p.

Dassonville S., Flickinger V., Taverne D., 2011, *Observation sociale des territoires alsaciens : Analyse des spécialisations territoriales et cohésion sociale en Alsace*, Agence de développement et d'urbanisation de l'agglomération Strasbourgeoise (ADEUS), Agence d'urbanisme de la région mulhousienne (AURM), document de travail.

Dodgshon R., 1998, *Society in Space and Time. A Geographical Perspective on Change*, Cambridge University Press.

Donzelot J., 2004, "La ville à trois vitesses : relégation, périurbanisation, gentrification", *Esprit*, No.3, 14-39.

Donzelot J., 2006, *Quand la ville se défait. Quelle politique face à la crise des banlieues?*, Paris, Seuil, 185 p.

Fabriès-Verfaillie M., Stragiotti P., 2000, *La France des Villes*, Bréal, Rosny, 336 p.

Floch J-M., 2007, "Les choix résidentiels dans l'aire urbaine de Besançon", in : Mattei M-F., Pumain D. (dir.), *Données urbaines 5*, Anthropos, coll. Villes, 129-139.

Fohlen C., 1982, *Histoire urbaine, de la conquête française à nos jours*, Tome 2, 824 p.

Gaschy M., 2011, *Le temps est venu, Mulhouse Alsace*, Agence d'urbanisme de la région mulhousienne AURM, 95 p.

Gerber Ph., 1999, "Processus de gentrification et demande sociale citadine. Exemple du centre-ville de Strasbourg", *Revue Géographique de l'Est*, Vol.39, No.2-3, 107-117.

Giroud M., 2015, "Mixité, contrôle social et gentrification", *La Vie des idées*.

Grafmeyer Y., Authier J.Y., 2011, *Sociologie urbaine*, Paris, Colin.

Guilly C., Noye C., 2004, *Atlas des nouvelles fractures sociales en France*, Paris, Autrement.

Harari J., 2005, "Ségrégation territoriale : l'effet des politiques foncières et des stratégies d'aménagement", *ContreTemps : Cité(s) en crise : ségrégations et résistances dans les quartiers populaires*, 103-121.

Hoyt H., 1939, *The Structure and Growth of Residential Neighbourhoods in American Cities Washington*, DC: Federal Housing Administration, 178 p.

Johnston R.J., 1973, "Social Area Change in Melbourne", *Australian Geographical Studies*, Vol.11, 79-98.

Jolliffe I.T., 2002, *Principal Component Analysis*, New York Berlin Heidelberg, Springer-Verlag.
DOI : 10.1007/978-1-4757-1904-8

Jonas S., 1994, *Le Mulhouse industriel, un siècle d'histoire urbaine, 1740-1848*, Tome 1, Paris, L'Harmattan, collection villes et entreprises, 271 p.

Jonas S., 2003, *Mulhouse et ses cités ouvrières, Perspectives historique 1840-1918*, Strasbourg, Oberlin.

Lajoie G., 1998, "La ségrégation des populations urbaines de 1982 à 1990", in : Pumain D., Mattei M-F. (dir.), *Données urbaines 2*, Anthropos, coll. Villes, 191-208.

Le Tocqueux J-L., 2007, "Ségrégation ou mixité socio-spatiale : de quoi parle-t-on ?", in : Pumain D., Mattei. M-F. (dir.), *Données urbaines 5*, Anthropos, coll. Villes, 141-148.

Mansuy M., Marpsat M., 1994, "La division sociale de l'espace dans les grandes villes françaises, hors Ile-de-France", in : Brun J., Rhein C. (dirs.), *La ségrégation dans la ville*, L'Harmattan, 195-227.

Massey D-S., Denton N-A., 1988, "The Dimensions of Residential Segregation", *Social Forces*, Vol.67, No.2, 281-315.
DOI : 10.2307/2579183

Maurin É., 2004, *Le ghetto français, Enquête sur le séparatisme social.* La république des idées, Paris, Seuil, 96 p.

Najib K., 2008, "Le loyer ; un indicateur de ségrégation socio-spatiale. Le cas de la ville de Besançon", *Colloque interdisciplinaire «La nouvelle question spatiale : Ségrégation urbaine et accès à l'emploi»*, université Paris Est, 15-16 septembre 2008, 32 p.

Najib K., Griffond-Boitier A., 2010, "Transformations socio-spatiales de Besançon : analyse exploratoire multi-date", *Actes des Neuvièmes Rencontres de Théo Quant*, Besançon, 4-6 mars 2009, 9 p.

Najib K., Griffond-Boitier A., 2011, "Socio-spatial Transformations of Three French Cities: Multi-date Exploratory Analysis", *17th European Colloquium on Quantitative and Theoretical Geography*, Athènes, Grèce, 2-5 septembre 2011, ID 119, 381-389.

Najib K., 2013, *Dynamiques socio-spatiales et modes d'habiter des espaces urbains : comparaison de Besançon, Mulhouse et Strasbourg*, Thèse de doctorat de géographie, Universite de Franche-Comté, 386 p.

Oberti M., Préteceille E., 2004, "Les classes moyennes et la ségrégation urbaine", *Éducation et sociétés*, Vol.14, 135-153.
DOI : 10.3917/es.014.0135

Pinçon M., Pinçon-Charlot M., 1989, *Dans les beaux quartiers*, Paris, Seuil.

Pinol J-L., 1996, *Atlas historique des villes de France*, Centre de culture contemporaine de Barcelone, Hachette, 318 p.

Piron M., Dureau F., Mullon C., 2004, "Utilisation de typologies multi-dates pour l'analyse des trasformations socio-spatiales de Bogota (Colombie)", *Cybergeo : http://cybergeo.revues.org*, No.256, 21 p.

Piron M., Dureau F., Mullon C., 2006, "Dynamique du parc de logements à Bogota : Analyse par typologie multi-dates", *Cybergeo : http://cybergeo.revues.org*, No.334, 26 p.
DOI : 10.4000/cybergeo.2925

Préteceille E., Rakotomalala M-J., Resplandy M., Calzada C., 2005, "Structures sociales des espaces résidentiels et de travail en Ile-de-France en 1999", in : Buisson M-A., Mignot D. (eds.), *Concentration économique et ségrégation spatiale*, Bruxelles, De Boeck, 183-199.

Pruvot M., Weber-Klein C., 1984, "Ecologie urbaine factorielle comparée : essai méthodologique et application à Strasbourg", *L'Espace Géographique*, No.2, 136-150
DOI : 10.3406/spgeo.1984.3913

Pumain D., Saint-Julien Th., 2001, *L'analyse spatiale 2 : les interactions spatiales*, Paris, Colin.

Rawls J., 1997, *Théorie de la justice*, Paris, Seuil.

Rérat P., 2012, "Choix résidentiel et gentrification dans une ville moyenne", *Cybergéo : European Journal of Geography*, No.579, 23 p.
DOI : 10.4000/cybergeo.24931

Reymond H., Cauvin C., Kleinschmager R., 1998, *L'espace géographique des villes. Pour une synergie multistrates*, Anthropos, coll. Villes.

Rhein C., 1994, "La ségrégation et ses mesures", in : Brun J., Rhein C. (dirs.), *La ségrégation dans la ville*, L'Harmattan, 121-162.

Rhein C., 1997, "Territoire et exclusion : des mots de l'État-providence et des maux de la société civile", *Cybergeo : http://cybergeo.revues.org*, No.34, 11 p.

Rhein C., 2002, "Intégration sociale, intégration spatiale", *L'Espace géographique*, Vol.31, No.3, 193-207.

Roncayolo M., 1952, "Évolution de la banlieue marseillaise dans la basse vallée de l'Huveaune", *Annales de géographie*, Vol.61, No.327, 342-356.
DOI : 10.3406/geo.1952.13670

Rosanvallon P., 2011, *La société des égaux*, Les Livres du nouveau monde, Seuil, 432 p.

Sanders L., 1992, *Système de villes et synergétique*, Paris, Antrhopos.

Schwabe M., 2007, "La ségrégation résidentielle dans les plus grandes villes françaises (1968-1999) : quel modèle urbain ?", *Cybergeo : http://cybergeo.revues.org*, No.398, 28 p.
DOI : 10.4000/cybergeo.10182

Séchet R., 2012, "Préface", in : Caradec V., Ertul S., Melchior J-P. (dirs.), *Les dynamiques des parcours sociaux*, Presses Universitaires de Rennes, 7-10.
DOI : 10.1016/B978-0-08-018052-6.50005-8

Shevky E., Bell W., 1955, *Social Area Analysis. Theory, Illustrative Applications and Computational Procedures*, Stanford University Press, 70 p.

Simon P., 1995, "La société partagée. Relations interethniques et interclasses dans un quartier en rénovation, Belleville, Paris 20ème", *Cahiers internationaux de sociologie*, No.98, 161-190.

Smith M.E., 2010, "The archaeological study of neighborhoods and districts in ancient cities", *Journal of Anthropological Archaeology*, No 29, 137-154.
DOI : 10.1016/j.jaa.2010.01.001

Subra P., 2006, "Heurs et malheurs d'une loi anti-ségrégation : les enjeux géopolitiques de la loi Solidarité et Renouvellement Urbain (SRU)", *Hérodote*, No.122, 138-171.

Tabard N., 1993, "Des quartiers pauvres aux banlieues aisées : une représentation sociale du territoire", *Économie et statistique*, No.270, 5-22.
DOI : 10.3406/estat.1993.5822

Tellier L.-N., Vertefeuille C., 1995, "Understanding Spatial Inertia: Center of Gravity, Population Densities, the Weber Problem, and Gravity Potential", *Journal of Regional Science*, No.35, 155-164.
DOI : 10.1111/j.1467-9787.1995.tb01404.x

Thisse J-F., Van Ypersele T., 1999, "Métropoles et concurrence territoriale", *Économie et statistique*, No.326-327, 19-30.
DOI : 10.3406/estat.1999.6223

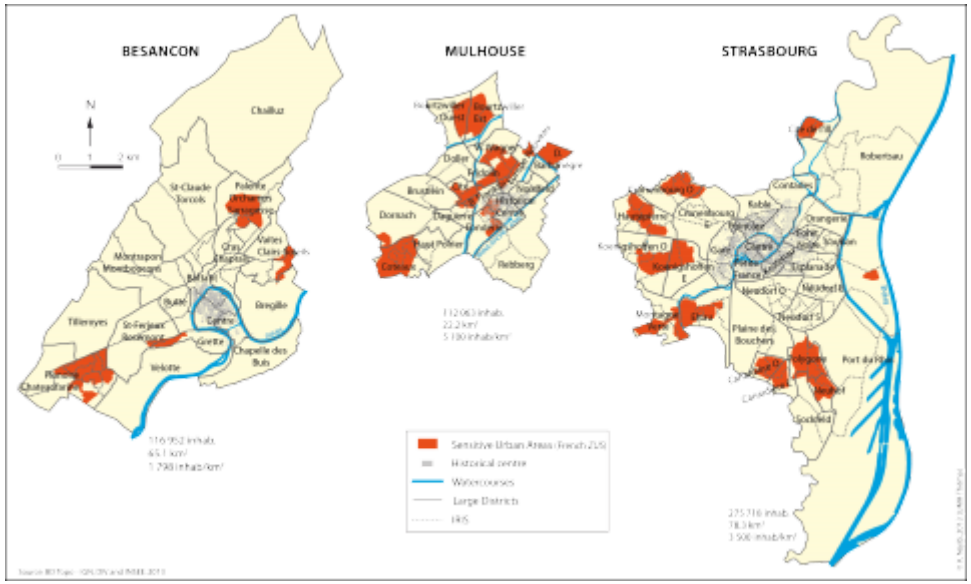
Tissot S., Poupeau F., 2005, "La spatialisation des problèmes sociaux", *Actes de la recherche en sciences sociales*, Vol.4, No.159, 4-9.
DOI : 10.3917/arss.159.0004

TNS-Sofres, 2007, *Les Français et leur habitat. Perception de la densité et des formes d'habitat*", Observatoire de la Ville, Rubrique Publications, Les Études TNS-Sofres.

Weber C., 1982, *Écologie urbaine comparée. Essai d'application sur quatre villes de la plaine rhénane : Strasbourg, Mulhouse, Fribourg et Bâle*, Thèse de doctorat en géographie, université Louis Pasteur de Strasbourg.

Annexe

Appendix 1. The studied cities and their IRIS districts



Notes

1 The geographer Raymonde Séchet (2012) explains that the French and European policies of reduction of gaps and territorial cohesion are highly tinged with the Rawlsian conception of equality rather than an action on personal capacities of individuals to act. The American philosopher John Rawls (1997) explains that the theory of justice must serve equality and constitutional democracy. According to him, justice as equality takes root in principles of equal liberty as well as fair equality of opportunities and differences.

2 The multicultural model consists of an affinity grouping of peers. Éric Charmes (2009) explains that this model is not necessarily to be rejected because this grouping is not only a source of community withdrawal and self-segregation. He shows, on the contrary, that this model can facilitate important social ties, ties of solidarity in favor of a professional or political intergration.

3 A previous study carried out on the scale of the large districts of Besançon showed the need to mobilize a finer scale for the analysis of segregations (Najib, 2008). Indeed, IRIS represent the smallest available census area. It is considered by many researchers (Commerçon, 1988 ; Massey et Denton, 1988, Préteceille et *al.*, 2005, Le Tocqueux, 2007...) as the basic unit best describing the socio-spatial structure of a city.

4 At the time of the investigation, only the 2006 census was available.

5 More exactly, it is about a normalized centered reduced PCA which allows us to overcome the heterogeneity of urban units and to nomalize statistical distributions (Jolliffe, 2002). The PCA without rotation shows a percentage of total inertia for the first two factors of 61% for the urban unit of Besançon, 56% for Mulhouse and 45% for Strasbourg. The break between the second and third factors is very big especially for Strasbourg and Besançon. Concerning Mulhouse, the first factor is very important and is sufficient to describe the urban structure by itself.

6

Variance decomposition for the optimal cluster (in percentage)	Besançon	Mulhouse	Strasbourg
Intra-class variance	30	35	36
Inter-class variance	70	65	64

7 www.meilleursagents.com

January 2014	Besançon	Mulhouse	Strasbourg
Price/m² apartment	1 801€	1 184€	2 478€
Price/m² house	1 849€	1 617€	2 629€

8 More exactly, we kept the type of housing, the tenure status of the main residences and the socio-occupational categories of economically active people. In addition, we considered the size and vacancy rate of housing, the unemployment rate and the professional activity of women, and also the ageing index, the foreign population and the possession or not of private cars. These new indicators help us to understand the diversity of the living conditions of populations, and in particular precarious situations. Besides, reducing the number of indicators by about half allows us not only to reduce the probability of distorting the spatial structure of a city, but also to better highlight socio-spatial inequalities.

9 Here, the historical centre is, in fact, mixed compared to the whole study city. However, taken separately, central districts can show processes of gentrification as Gerber (1999) showed in the Strasbourg case.

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	URL	http://cybergeo.revues.org/docannexe/image/27975/img-2.png
	Fichier	image/png, 619k
	Titre	Figure 3 : Column chart of eigenvalues in 2006
	URL	http://cybergeo.revues.org/docannexe/image/27975/img-3.png
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